

# **CITY OF BLOOMINGTON (PWS 6040007) SOURCE WATER ASSESSMENT FINAL REPORT**

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**October 1, 2002**



## **State of Idaho Department of Environmental Quality**

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## Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and construction factors associated with the spring and aquifer characteristics.

This report, *Source Water Assessment for City of Bloomington, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the public water system (PWS).**

The City of Bloomington (PWS #6040007) drinking water system consists of one spring and one reservoir. The spring was originally developed in the 1930s and most recently redeveloped in 1982 when the current water system was installed. The spring produces approximately 792,000 gallons of water daily and uses gravity to fill a 75,000-gallon storage reservoir. The distribution system pipes range in size from 6 to 8 inch diameter, and is predominantly plastic PVC pipe. The system currently serves approximately 225 persons through 114 connections. Water use is mostly residential, but also supplies one dairy.

The only potential contaminant source within the spring's delineation capture zone is related to the predominant amount of undeveloped rangeland.

For the assessment, a review of laboratory tests was conducted using the Idaho Drinking Water Information Management System (DWIMS) and the State Drinking Water Information System (SDWIS). Total coliform bacteria were detected between October 1992 and December 2000 at various locations in the distribution system. The inorganic chemicals (IOCs) cyanide, fluoride, selenium, and nitrate have been detected in the drinking water, but at levels below the maximum contaminant level (MCL) for each chemical. Sodium and calcium were also detected, although no MCL exists at this time for these chemicals. The IOC arsenic was detected in concentrations of 8 micrograms per liter (µg/L) in January 1996. This level is approaching the revised MCL of 10 µg/L. In October 2001, the EPA lowered the arsenic MCL from 50 µg/L to 10 µg/L. No volatile organic chemicals (VOCs) or synthetic organic chemicals (SOCs) have been detected in the drinking water.

Final susceptibility scores for springs are derived from system construction scores, and potential contaminant/land use scores, with the potential contaminant/land use score being more heavily weighted. Potential contaminants are divided into four categories, IOCs (i.e. nitrates, arsenic), VOCs (i.e. petroleum products), SOC (i.e. pesticides), and microbial contaminants (i.e. bacteria). As different sources can be subject to various contamination settings, separate scores are given for each type of contaminant.

In terms of total susceptibility, the spring rated moderate for IOCs and microbials, and low for VOCs and SOC. System construction rated high and land use scores were low for IOCs, VOCs, SOC, and microbials.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well or spring sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

For the City of Bloomington, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system’s components and its capacity). Because the arsenic in the spring water is greater than one-half the level of the revised MCL, the City of Bloomington water users may need to consider implementing engineering controls to monitor, maintain or reduce the level of this contaminant in the water system. The EPA plans to provide up to \$20 million over the next two years for research and development toward more cost-effective technologies to help small systems meet the new MCL. EPA (2002) recently released an issue paper entitled *Proven Alternatives for Aboveground Treatment of Arsenic in Groundwater*. As land uses within most of the source water assessment areas are outside the direct jurisdiction of City of Bloomington, collaboration and partnerships with state, local agencies and industry groups, should be established and are critical to success.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. There are transportation corridors near the spring delineation, therefore the Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Bear Lake County Soil and Water Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Pocatello Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

# SOURCE WATER ASSESSMENT FOR CITY OF BLOOMINGTON, IDAHO

## Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this assessment means.** Maps showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are included. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is included.

### Level of Accuracy and Purpose of the Assessment

The DEQ is required by the EPA to assess over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the spring. All assessments must be completed by May of 2003. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. **This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. DEQ recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The local community based on its own needs and limitations should determine what information is necessary to develop a drinking water protection program. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

## **Section 2. Conducting the Assessment**

### **General Description of the Source Water Quality**

The City of Bloomington (PWS #6040007) drinking water system consists of one spring that provides drinking water to approximately 225 persons through 114 connections. The inorganic chemicals (IOCs) fluoride, nitrate, cyanide were detected in the drinking water, but at levels below the maximum contaminant level (MCL) for each chemical. Sodium and calcium were also detected, although no MCL exists at this time for these chemicals. Total coliform bacteria were detected between October 1992 and December 2000 at various locations in the distribution system. No volatile organic chemicals (VOCs) or synthetic organic chemicals (SOCs) have been detected in the drinking water.

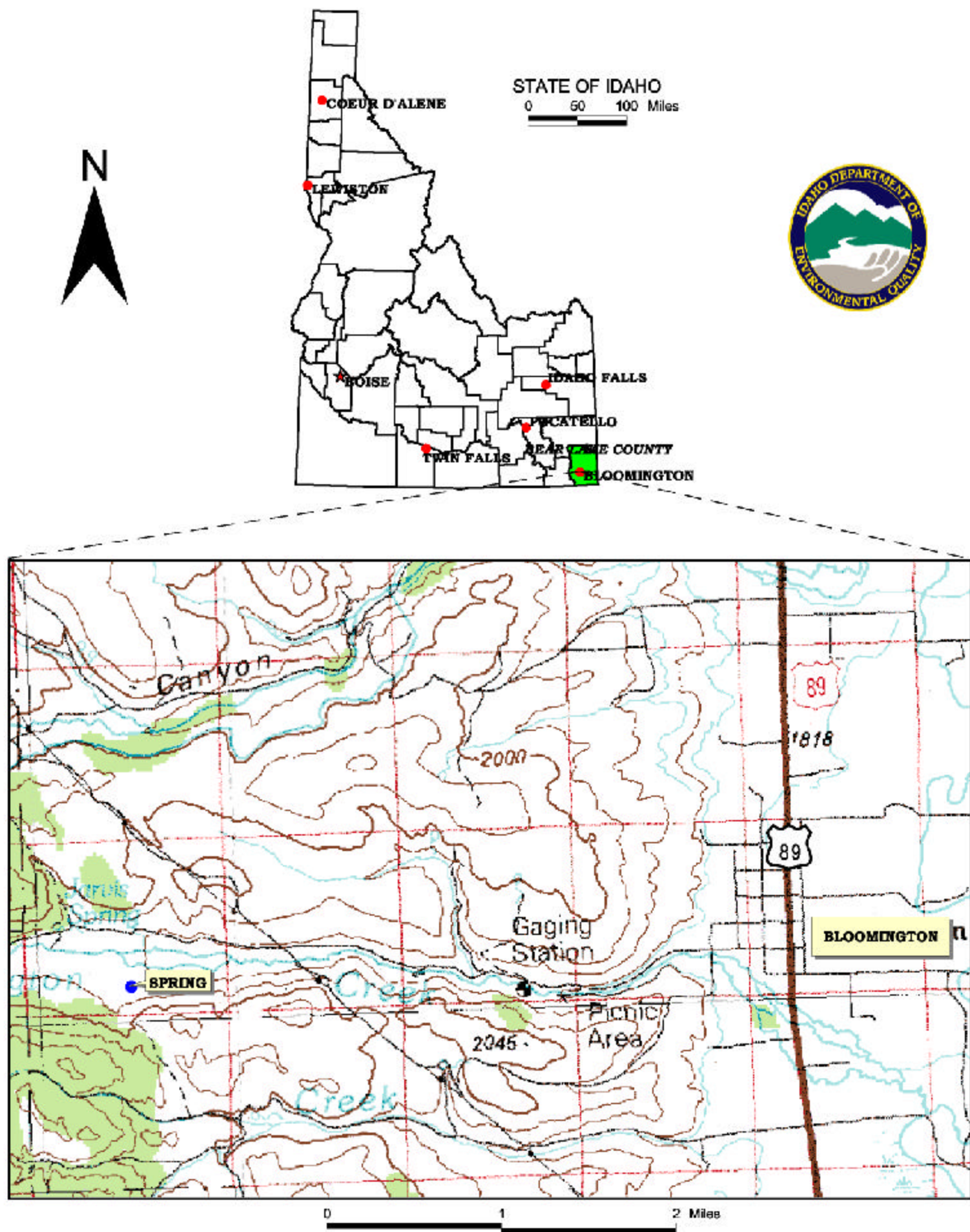
### **Defining the Zones of Contribution – Delineation**

The delineation process establishes the physical area around the spring that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a source) for water in the aquifer. Washington Group International Inc. (WGI) was contracted by DEQ to define the public water system's zones of contribution. WGI used a conceptual computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Bear River - Dingle Swamp hydrologic province in the vicinity of the City of Bloomington. The computer model used site specific data, assimilated by WGI from a variety of sources including operator records, spring construction information (when available) and hydrogeologic reports. A summary of the hydrogeologic information from WGI is provided below.

### **Hydrogeologic Conceptual Model**

Graham and Campbell (1981) identified and described 70 regional ground water systems throughout Idaho. Thirty-four of these fall within the southeastern part of the state. The “None” hydrologic province, as defined in the WGI (2001) report, includes all the area outside of the 34 regional systems in southeast Idaho. The smaller and more localized aquifers in the “None” province typically are situated in the foothills and mountains that surround and recharge the regional ground water systems.

**FIGURE 1. Geographic Location of the City of Bloomington**



The mountains and valleys within the “None” hydrologic province were formed during two events separated by approximately 50 to 70 million years (Alt and Hyndman, 1989, pp. 329 and 336). The overthrust belt of the northern Rocky Mountains was formed roughly 70 to 90 million years ago through the intrusion of granitic magma and a massive eastward movement of large slabs of layered sedimentary rocks along faults that dip shallowly westward (Alt and Hyndman, 1989, p. 329). This movement caused extreme folding and fracturing of the sedimentary and granitic rocks and, in many cases, left older formations lying on top of younger ones. Later Basin and Range block faulting broke up the largely eroded Rocky Mountains into large uplifted and downthrown blocks resulting in the present day northwest trending mountains and valleys seen throughout southeast Idaho. Paleozoic and Precambrian limestone, dolomite, sandstone, shale, siltstone, and quartzite are the predominant materials forming the mountains and probably compose the bedrock underlying the valleys between Salmon, Idaho on the north side of the Snake River Plain and Franklin, Idaho near the Utah/Idaho border (Dion, 1969, p.18; Kariya et al., 1994, p. 6; Bjorklund and McGreevy, 1971, p. 12; and Parlman, 1982, p. 9).

Ground water movement in the mountains is primarily through a system of solution channels, fractures and joints that commonly transmit water independently of surface topography (Bjorklund and McGreevy, 1971, p. 15; Dion, 1969, p. 18). Ralston and others (1979, pp. 128-129) state that the geologic structural features also can contribute to the development of cross-basin ground-water flow systems. Ground water entering a geologic formation tends to follow the formation because hydraulic conductivities are greater parallel to the bedding planes than across them. Synclines and anticlines provide structural avenues for groundwater flow under ridges from one valley to another.

The average annual precipitation in the mountains of southeast Idaho ranges from 20 inches on ridges near Soda Springs to over 45 inches on the Bear River Range (Ralston and Trihey, 1975, p. 7, and Dion, 1969, p. 11). The valleys receive an average of 7 to 10 inches annually (Donato, 1998, p. 3, and Dion, 1969, p. 11). Precipitation and seepage from streams are the primary source of recharge to the mountain aquifers (Kariya, et al., 1994, p. 18, and Parlman, 1982, p. 13).

Ground water discharge occurs as springs and seeps issuing from faults, fractures, and solution channels and as underflow to regional aquifers. The Bear River Basin in the far southeast corner of the state contains hundreds of springs issuing primarily from fractures and solution openings in the bedrock mountains (Dion, 1969, p. 47, and Bjorklund and McGreevy, 1971, pp. 34-35). Within Cache Valley many springs discharge from the valley-fill deposits (Kariya et al., 1994, p. 32).

There is little available information on the distribution of hydraulic head and the hydraulic properties of the aquifers in the “None” hydrologic province. No USGS (2001) or Idaho Statewide Monitoring Network (Neely, 2001) wells are located in the areas of concern to provide information on ground-water flow direction and hydraulic gradient or to aid in model calibration. The information that is available indicates that the hydraulic properties are quite variable, even within a specific rock type. Ralston and others (1979, p. 31), for example, present hydraulic conductivity estimates for fractured chert ranging from 2.2 to 75 ft/day. Estimates for phosphatic shale are as low as 0.07 ft/day (unfractured) and as high as 25 ft/day (fractured).



## **Springs and Spring Delineation Methods**

A spring is defined as a concentrated discharge of ground water appearing at the ground surface as flowing water (Todd, 1980). The discharge of a spring depends on the hydraulic conductivity of the aquifer, the area of contributing recharge to the aquifer, and the rate of aquifer recharge. PWS springs are generally perennial. Large seasonal changes in the discharge rates are an indication of a relatively shallow flow system. While most springs fluctuate in their rate of discharge, springs in volcanic rock (e.g., basalt) are noted for their nearly constant discharge (Todd, 1980).

## **None Hydrologic Province Source Area Delineation Report Delineation Methods**

Delineation of the wellhead protection area for a spring involves special consideration. Hydrogeologic setting is foremost among the factors that control the shape and extent of the capture zone. The capture zone for a spring resulting from the presence of a high-permeability fracture extending to great depth will be much different from the capture zone resulting from a depression spring formed where the ground surface intersects the water table in a unconsolidated aquifer. The latter can be reasonably modeled as either a well or an internal constant-head boundary.

In many cases, however, the methods commonly used to delineate protection areas for water supply wells are not applicable (Jensen et al., 1997). Application of the refined method using WhAEM (Kraemer et al., 2000), for instance, may not be appropriate for a fracture or tubular spring producing from an aquifer that displays a high degree of heterogeneity and anisotropy. Techniques that are most applicable to the springs within the scope of this report are the topographic, refined, and calculated fixed-radius methods.

Hydrogeologic mapping techniques have been useful in characterizing the hydrogeologic setting and the zone of contribution to springs (Jensen et al., 1997, pp. 6-7). Other techniques such as tracer and isotope studies, potentiometric surface mapping, geochemical characterization, and geophysical survey interpretation require data that are not available without additional fieldwork.

## **Calculated Fixed-Radius Method**

Application of the calculated fixed-radius method for delineating springs in southeast Idaho involves model-input determination and factor of safety determination. Model calibration and sensitivity do not apply to this method. A sensitivity analysis is not a necessary precursor to the factor of safety determination with the calculated fixed-radius method, in part, because determination of a flow direction factor of safety is unnecessary for a circular source area. A circular source area also makes consideration of uncertainty associated with capture zone width unnecessary.

The calculated fixed-radius method was used for delineating capture zones for PWS springs located in areas with a general lack of hydrogeologic data. The fixed radii for the 3-, 6-, and 10- year capture zones were calculated using equations presented by Keely and Tsang (1983) for the velocity distribution surrounding a pumping well. It is assumed that the majority of PWS springs issue from sedimentary rock, due to the prevalence of this material throughout the mountains of southern Idaho. For this reason, the hydrologic input used to calculate the time dependent radii are the default values presented in Table F-3 of the Idaho Wellhead Protection Plan for mixed volcanic and sedimentary rocks, primarily sedimentary rocks (IDEQ, 1997, p. F-6).



An average discharge rate of 563,000 gal/day was calculated for the PWS springs that have reliable discharge data and used to calculate the fixed-radii for springs with unknown discharge and for springs with a discharge equal to or less than the average rate. The resulting 3-, 6-, and 10-year capture zone radii of 462, 688, and 933 feet were rounded up to 500, 700, and 1,000 feet, respectively. To maintain conservatism, the actual discharge rates were used for springs with discharges greater than the average.

## **Identifying Potential Sources of Contamination**

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act. Furthermore, these sources have a sufficient likelihood of releasing such contaminants into the environment at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. Field surveys conducted by DEQ and reviews of available databases identified only one potential contaminant source for the spring. This potential contaminant source is associated with grazing livestock.

It is important to understand that a release may never occur from a potential source of contamination provided best management practices are being used. Many potential sources of contamination are regulated at the federal level, state level, or both, to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

## **Contaminant Source Inventory Process**

A two-phased contaminant inventory of the study area was conducted in May and June 2002. The first phase involved identifying and documenting potential contaminant sources within the City of Bloomington source water assessment area through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to identify and add any additional potential sources in the delineated areas. This task was undertaken with the assistance of Mr. Dale Thornock. A map with the spring location, delineated area, and potential contaminant sources are provided with this report (Figure 2). Each potential contaminant source has been given a unique site number that references tabular information associated with the public water system spring (Table 1).

**Table 1. City of Bloomington, Spring, Potential Contaminant Inventory**

Site #	Source Description	TOT Zone <sup>1</sup> (years)	Source of Information	Potential Contaminants <sup>2</sup>
	Grazing Cattle	0-3	Drinking Water Waiver	IOC, Microbials
	Grazing Cattle	3-6	Drinking Water Waiver	IOC
	Grazing Cattle	6-10	Drinking Water Waiver	IOC

<sup>1</sup>TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

<sup>2</sup> IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

### Section 3. Susceptibility Analyses

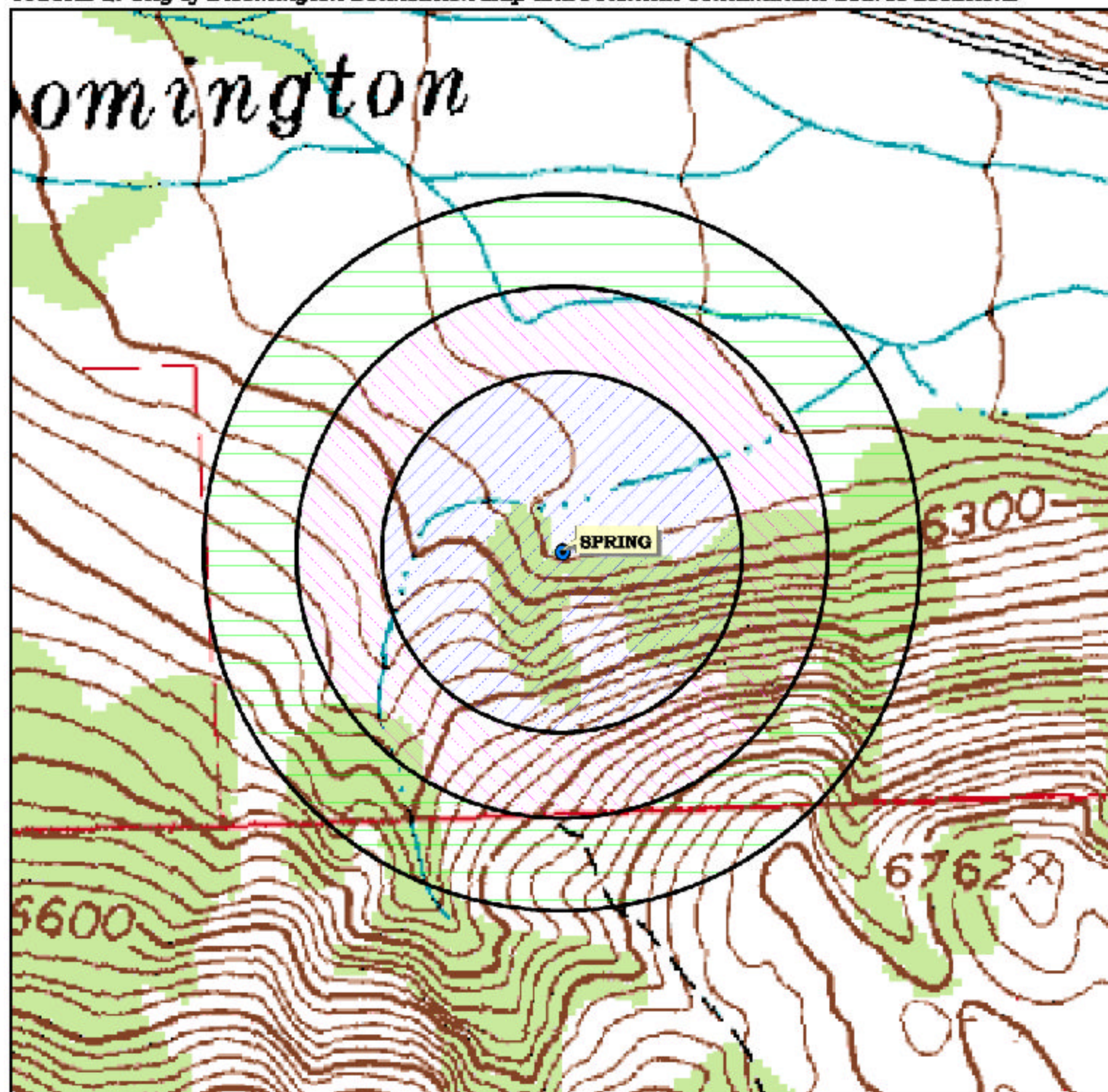
The spring's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: construction of the water collection system, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Attachment A contains the susceptibility analysis worksheets. The following summaries describe the rationale for the susceptibility ranking.

#### Spring Construction

Spring construction scores are determined by evaluating whether the spring has been constructed according to Idaho Code (IDAPA 58.01.08.04) and if the spring's water is exposed to any potential contaminants from the time it exits the bedrock to when it enters the distribution system. If the spring's intake structure, infiltration gallery, and housing are located and constructed in such a manner as to be permanent and protect it from all potential contaminants, is contained within a fenced area of at least 100 feet in diameter, and is protected from all surface water by diversions, berms, etc., then Idaho Code is being met and the score will be lower. If the spring's water comes in contact with the open atmosphere before it enters the distribution system, it receives a higher score. Likewise, if the spring's water is piped directly from the bedrock to the distribution system or is collected in a protected spring box without any contact to potential surface-related contaminants, the score is lower.

The spring rated high for system construction. The 1997 sanitary survey conducted by DEQ stated that the spring water is captured by an 8-foot by 10-foot concrete box, which has been poured against a rock outcropping. The area around the spring is fenced and privately owned. The sanitary survey also noted that the overflow is not constructed in a manner, which prevents dust, insects, etc. from entering the spring box. In addition, the survey noted a missing lock on the spring box and possible influence by surface runoff and shallow groundwater. Berms or ditches upgradient of the spring can be used to divert surface related water away from the spring box.

**FIGURE 2. City of Bloomington Delineation Map and Potential Contaminant Source Locations**



0 500 1000 Feet

LEGEND			
Time of Travel Zones	★ Dairy	⚠ Toxic Release Inventory	
1B (3 yr TOT)	● LUST Site	● SARA Title III Site (EPCRA)	
2 (6 yr TOT)	▲ Closed UST Site	● Recharge Point	
3 (10 yr TOT)	▲ Open UST Site	● Injection Well	
● Wellhead	● Business Mailing Unit	● Group1 Site	
● Enhanced Inventory	● NPDES Site	● Cyanide Site	
● CERCLA Site	⛏ Mine	■ Landfill	
● RCRA Site	● AST	■ Wastewater Land App Site	



**PWS# 6040007**  
**SPRING**

## Potential Contaminant Source and Land Use

The potential contaminant sources and land use within the delineated zones of water contribution are assessed to determine the spring's susceptibility. When agriculture is the predominant land use in the area, this may increase the likelihood of agricultural wastewater infiltrating the ground water system. Agricultural land is counted as a source of leachable contaminants and points are assigned to this rating based on the percentage of agricultural land. The land use within the area surrounding the City of Bloomington spring is predominately rangeland.

In terms of potential contaminant sources, the land use susceptibility ratings for the spring are low for IOCs, VOCs, SOC, and microbials.

## Final Susceptibility Ranking

A detection above a drinking water standard MCL, or any detection of a VOC or SOC in the drinking water, will automatically give a high susceptibility rating to a spring despite the land use of the area because a pathway for contamination already exists. Additionally, potential contaminant sources within 100 feet of a spring will automatically lead to a high susceptibility rating. System construction scores have less weight than land use in the final scores. Having multiple potential contaminant sources in the 0- to 3-year time of travel zone (Zone 1B) contribute greatly to the overall ranking.

**Table 2. Summary of City of Bloomington Susceptibility Evaluation**

Drinking Water Source	Susceptibility Scores <sup>1</sup>								
	Potential Contaminant Inventory and Land Use				System Construction	Final Susceptibility Ranking			
	IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Spring	L	L	L	L	H	M	L	L	M

<sup>1</sup>H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,  
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

## Susceptibility Summary

The IOCs cyanide, fluoride, selenium, arsenic, and nitrate have been detected in the drinking water, although the reported concentrations of these chemicals were below the MCL for each chemical. Calcium and sodium were also detected. The arsenic detection was 8 µg/L, which is approaching the revised MCL of 10 µg/L. No VOCs or SOCs have been detected in the spring water.

In terms of total susceptibility, the spring rated moderate for IOCs and microbials, and low for VOCs and SOCs. System construction rated high and land use scores were low for IOCs, VOCs, SOCs, and microbials.

## **Section 4. Options for Drinking Water Protection**

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well or spring sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed source water protection program will incorporate many strategies. For City of Bloomington, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey. No potential contaminants (pesticides, paint, fuel, cleaning supplies, etc.) should be stored or applied within 100 feet of the spring. Land uses within most of the source water assessment area is outside the direct jurisdiction of the City of Bloomington, therefore partnerships with state and local agencies, industrial and commercial groups should be established to ensure future land uses are protective of ground water quality.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineation contains some agricultural land uses. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, Bear Lake Soil and Water Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Pocatello Regional Office of the DEQ or the Idaho Rural Water Association.

## **Assistance**

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Pocatello Regional DEQ Office           (208) 236-6160

State DEQ Office                           (208) 373-0502

Website: <http://www.deq.state.id.us>

Water suppliers serving fewer than 10,000 persons may contact Ms. Melinda Harper (<mailto:mlharper@idahoruralwater.com>), Idaho Rural Water Association, at 1-208-343-7001 for assistance with drinking water protection (formerly wellhead protection) strategies.



## POTENTIAL CONTAMINANT INVENTORY LIST OF ACRONYMS AND DEFINITIONS

**AST (Aboveground Storage Tanks)** – Sites with aboveground storage tanks.

**Business Mailing List** – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

**CERCLIS** – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as a Superfund is designed to clean up hazardous waste sites that are on the national priority list (NPL).

**Cyanide Site** – DEQ permitted and known historical sites/facilities using cyanide.

**Dairy** – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

**Deep Injection Well** – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

**Enhanced Inventory** – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

**Floodplain** – This is a coverage of the 100year floodplains.

**Group 1 Sites** – These are sites that show elevated levels of contaminants and are not within the priority one areas.

**Inorganic Priority Area** – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

**Landfill** – Areas of open and closed municipal and non-municipal landfills.

**LUST (Leaking Underground Storage Tank)** – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

**Mines and Quarries** – Mines and quarries permitted through the Idaho Department of Lands.)

**Nitrate Priority Area** – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

**NPDES (National Pollutant Discharge Elimination System)** – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

**Organic Priority Areas** – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

**Recharge Point** – This includes active, proposed, and possible recharge sites on the Snake River Plain.

**RCRA** – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

**SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities)** – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

**Toxic Release Inventory (TRI)** – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

**UST (Underground Storage Tank)** – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

**Wastewater Land Applications Sites** – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

**Wellheads** – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

**NOTE:** Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.



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## Attachment A

### City of Bloomington Susceptibility Analysis Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = System Construction + (Potential Contaminant/Land Use x 0.6)

2) Microbial Final Score = System Construction + (Potential Contaminant/Land Use x 1.125)

Final Susceptibility Scoring:

0 - 7 Low Susceptibility

8 - 15 Moderate Susceptibility

≥ 15 High Susceptibility

## 1. System Construction

SCORE

Intake structure properly constructed

NO

1

Is the water first collected from an underground source

NO

2

Yes = spring developed with casing into the ground; lower score

No = water collected after it contacts atmosphere or unknown; higher score

Total System Construction Score

3

## 2. Potential Contaminant Source / Land Use

IOC  
ScoreVOC  
ScoreSOC  
ScoreMicrobial  
Score

Land Use Zone 1A

RANGELAND, WOODLAND, BASALT

0

0

0

0

Farm chemical use high

NO

0

0

0

IOC, VOC, SOC, or Microbial sources in Zone 1A

NO

NO

NO

NO

NO

Total Potential Contaminant Source/Land Use Score - Zone 1A

0

0

0

0

## Potential Contaminant / Land Use - ZONE 1B (0-3 TOT)

Contaminant sources present (Number of Sources)

YES

1

0

0

1

(Score = # Sources X 2 ) 8 Points Maximum

2

0

0

2

Sources of Class II or III leacheable contaminants or

NO

0

0

0

4 Points Maximum

0

0

0

Zone 1B contains or intercepts a Group 1 Area

NO

0

0

0

0

Land use Zone 1B Greater Than 50% Non-Irrigated Agricultural

2

2

2

2

Total Potential Contaminant Source / Land Use Score - Zone 1B

4

2

2

4

## Potential Contaminant / Land Use - ZONE II(3-6 TOT)

Contaminant Sources Present

YES

1

0

0

Sources of Class II or III leacheable contaminants or

NO

2

0

0

Land Use Zone II Greater Than 50% Non-Irrigated Agricultural

1

1

1

Potential Contaminant Source / Land Use Score - Zone II

3

1

1

0

## Potential Contaminant / Land Use - ZONE III (6-10 TOT)

Contaminant Source Present

YES

1

0

0

Sources of Class II or III leacheable contaminants or

NO

0

0

0

Is there irrigated agricultural lands that occupy &gt; 50% of

NO

0

0

0

Total Potential Contaminant Source / Land Use Score - Zone III

1

0

0

0

Cumulative Potential Contaminant / Land Use Score

5

2

2

5

## 4. Final Susceptibility Source Score

8

5

5

8

## 5. Final Well Ranking

Moderate

Low

Low

Moderate